

AMENDMENTS TO THE CLAIMS

1. (Currently amended) An image sensor comprising:
a substrate formed over a base layer;
a plurality of pixel cells formed within said substrate, each pixel cell comprising a photo-conversion device; and
a plurality of trenches, each trench being provided along a perimeter of a respective pixel cell, each trench extending at least to a surface of the base layer, each trench having sidewalls, and being at least partially filled with a material that inhibits electrons from passing through said trench.
2. (Original) The sensor of claim 1, further comprising a dielectric material formed along at least a portion of said sidewalls.
3. (Original) The sensor of claim 2, wherein the dielectric material is an oxide.
4. (Withdrawn) The sensor of claim 2, wherein the dielectric material is formed on the sidewalls of the trench but not on a bottom of the trench.
5. (Withdrawn) The sensor of claim 2, wherein the dielectric material comprises at least two materials having different indices of refraction.
6. (Original) The sensor of claim, 1 wherein said material is a conductive material.
7. (Original) The sensor of claim 6, wherein said conductive material comprises one of doped polysilicon, undoped polysilicon and boron-doped carbon.
8. (Original) The sensor of claim 1, wherein said trench has a depth greater than about 2000 Angstroms.
9. (Original) The sensor of claim 8, wherein said trench has a depth in the range of about 4000 to about 5000 Angstroms.
10. (Original) The sensor of claim 1, wherein the sensor comprises a CMOS image sensor.

11. (Original) The sensor of claim 1, wherein the sensor comprises a CCD image sensor.

12. (Withdrawn) The sensor of claim 1, wherein the pixel cells are red pixel cells of a Bayer pattern.

13. (Withdrawn) The sensor of claim 1, further comprising a contact adjacent at least one of the plurality of trenches, for biasing the material within the trench positive or negative.

14. (Currently amended) A structure for isolating an active area on a semiconductor device, said structure comprising:

a trench formed in a substrate along at least a portion of a periphery of said active area in said semiconductor device, wherein said trench extends at least to a surface of a base layer below said substrate, and wherein said trench has sidewalls;

a dielectric liner formed along said sidewalls; and

a material formed over said dielectric liner that at least partially fills said trench and inhibits electrons from passing through said trench.

15. (Original) The structure of claim 14, wherein the dielectric liner comprises an oxide material.

16. (Currently amended) The structure of claim 14, wherein the dielectric liner is one of high-density plasma oxide and ~~spin-on~~ spin-on dielectric oxide.

17. (Withdrawn) The structure of claim 14, wherein the dielectric liner is formed of a material selected from the group consisting of silicon dioxide, aluminum oxide, undoped polysilicon, silicon nitride, PE-oxide and FSG-oxide.

18. (Withdrawn) The structure of claim 14, wherein the dielectric liner is formed of at least two materials having different indices of refraction.

19. (Withdrawn) The structure of claim 14, wherein the dielectric liner is formed of PE-oxide and FSG-oxide.

20. (Original) The structure of claim 14, wherein the material is a conductive material.

21. (Withdrawn) The structure of claim 20, wherein the conductive material comprises one of doped polysilicon, undoped polysilicon and boron-doped carbon.

22. (Original) The structure of claim 14, wherein the trench has a depth greater than about 2000 Angstroms.

23. (Original) The structure of claim 22, wherein the trench has a depth in the range of about 4000 to about 5000 Angstroms.

24. (Original) The structure of claim 14, wherein the semiconductor device comprises one of a CMOS image sensor or a CCD image sensor.

25. (Withdrawn) The structure of claim 14, further comprising a contact adjacent the trench, for biasing the material within the trench positive or negative.

26. (Currently amended) A processing system, said processing system comprising:

a processor;

a semiconductor device;

a trench formed in a substrate along at least a portion of a periphery of said active area in said semiconductor device, wherein said trench extends at least to a surface of a base layer below said substrate, and wherein said trench has sidewalls;

a dielectric liner formed along said sidewalls; and

a material formed over said insulating liner that at least partially fills said trench and inhibits electrons from passing through said trench.

27. (Original) The processing system of claim 26, wherein the dielectric liner is an oxide material.

28. (Currently amended) The processing system of claim 26, wherein the dielectric liner is one of high-density plasma oxide and ~~spin-on~~ spin-on dielectric oxide.

29. (Original) The processing system of claim 26, wherein the conductive material comprises one of doped polysilicon, undoped polysilicon and boron-doped carbon.

30. (Original) The processing system of claim 26, wherein the trench has a depth greater than about 2000 Angstroms.

31. (Original) The processing system of claim 30, wherein the trench has a depth in the range of about 4000 to about 5000 Angstroms.

32. (Original) The processing system of claim 26, wherein the semiconductor device comprises a CMOS image sensor.

33. (Original) The processing system of claim 26, wherein the semiconductor device comprises a CCD image sensor.

34. (Withdrawn) The processing system of claim 26, wherein the dielectric liner comprises at least two materials having different indices of refraction.

35. (Withdrawn) The processing system of claim 26, wherein the dielectric liner comprises PE-oxide and FSG-oxide.

36. (Withdrawn) The processing system of claim 26, wherein the dielectric liner is provided along the sidewalls of the trench but not on a bottom of the trench.

37-48 (Canceled).

49. (New) An image sensor comprising:

a substrate formed over an epitaxial layer;

a plurality of pixel cells formed within said substrate, each pixel cell comprising a photo-conversion device; and

a plurality of trenches, each trench being provided along a perimeter of a respective pixel cell, each trench extending at least to a surface of the epitaxial layer,

each trench having sidewalls, a first material being formed along said sidewalls, a second material being formed over said first material that at least partially fills said trench and inhibits electrons from passing through said trench, and a contact in connection with said second material that removes electrons from said second material.

50. (New) The image sensor of claim 49, wherein the first material is an oxide.

51. (New) The image sensor of claim 49, wherein the second material is a conductive material.